WHAT IS CLAIMED IS:

1. A method of manufacturing a semiconductor device in which a plurality of combinations of a gate electrode and a gate insulating film are formed so as to extend in parallel on a semiconductor substrate, comprising the steps of:

forming a first insulating film along surfaces of said plurality of combinations of the gate electrode and the gate insulating film, and said semiconductor substrate, respectively; and

forming a second insulating film different from said first insulating film on said first insulating film; wherein

the steps of forming said first insulating film and forming said second insulating film are alternately repeated.

2. The method of manufacturing a semiconductor device according to claim 1, wherein

said first insulating film is formed under a condition that

a concentration of O_3 is set to 0 to 3.0wt%,

a molar ratio of O_3/TEOS is set to at most 3.0,

a temperature for film-forming is set to 450 to 550°C,

a pressure for film-forming is set to 798 to 266hPa, and

an inert gas is used as a carrier gas.

3. The method of manufacturing a semiconductor device according to claim 1, wherein

said first insulating film is composed of USG, and

said second insulating film is composed of one substance selected from a group consisting of BPSG, PSG, BSG, and USG.

4. The method of manufacturing a semiconductor device according to claim 1, wherein

said first insulating film has a film thickness of 3 to 5 % of a distance between the gate electrodes of adjacent two of said combinations.

5. The method of manufacturing a semiconductor device according to claim 1, wherein

the step of forming said second insulating film is performed under a condition that

a concentration of O_3 is set to 8.0 to 17.0wt%,

a molar ratio of O_3/TEOS is set to 3.0 to 15.0,

a temperature for film-forming is set to 450 to 550°C,

a pressure for film-forming is set to 798 to 266hPa,

a total concentration of an impurity composed of at least one of P and B is set to at most 15wt%, and

an inert gas is used as a carrier gas.

6. The method of manufacturing a semiconductor device according to claim 1, wherein

said second insulating film has a film thickness of 5 to 10 % of the distance between the gate electrodes of adjacent two of said combinations.

7. The method of manufacturing a semiconductor device according to claim 1, wherein

the steps of forming said first insulating film and forming said second insulating film are repeated until a concave formed by said first insulating film or said second insulating film in a space between the gate electrodes of adjacent two of said combinations is positioned above the upper surface of said gate electrode.

8. The method of manufacturing a semiconductor device according to claim 1, wherein

said second insulating film is deposited using a reaction gas consisting of a plurality of kinds of gases which flows into a chamber, and

after the step of depositing said second insulating film, a supply into said chamber of at least one of said plurality of kinds of gases is stopped, and a gas which is different from said reaction gas and does not cause a reaction for deposition of said second insulating film flows into said

chamber so that a pressure in said chamber is maintained constant.

9. The method of manufacturing a semiconductor device according to claim 1, wherein

said second insulating film is deposited using a reaction gas consisting of a plurality of kinds of gases which flows into a chamber, and

after the step of depositing said second insulating film, a supply into said chamber of at least one of said plurality of kinds of gases is stopped , and at least one of said plurality of kinds of gases continues to flow into said chamber so that a pressure in said chamber is maintained constant.

10. The method of manufacturing a semiconductor device according to claim 1, wherein

said second insulating film is deposited using a reaction gas consisting of a plurality of kinds of gases which flows into a chamber, and

after the step of depositing said second insulating film, at least one of said plurality of kinds of gases flows through a vent line to the outside of said chamber, and a gas which is different from said reaction gas and does not cause a reaction for deposition of said second insulating film flows into said chamber so that a pressure in said chamber is maintained constant.

11. The method of manufacturing a semiconductor device according to claim 1, wherein

said second insulating film is deposited using a reaction gas consisting of a plurality of kinds of gases which flows into a chamber, and

after the step of depositing said second insulating film at least one of said plurality of kinds of gases flows through a vent line to the outside of said chamber, and at least one of said plurality of kinds of gases continues to flow into said chamber so that a pressure in said chamber is maintained constant.

12. The method of manufacturing a semiconductor device according to claim 1, wherein

after the steps of forming said first insulating film and forming said second insulating film are repeated, a third insulating film is formed on a film formed later out of said first insulating film and said second insulating film.

13. The method of manufacturing a semiconductor device according to claim 12, wherein

the step of forming said third insulating film is performed under a condition that

a pressure for film-forming is set to at most 266hPa,

a concentration of O_3 is set to 8.0 to 17.0wt%,

a temperature for film-forming is set to 450 to 550°C, and

an inert gas is used as a carrier gas.

14. The method of manufacturing a semiconductor device according to claim 12, wherein

said third insulating film has a film thickness of at most 1.5μm.

15. The method of manufacturing a semiconductor device according to claim 12, wherein

said third insulating film is a USG film.